

This Page Is Inserted by IFW Operations
and is not a part of the Official Record

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images may include (but are not limited to):

- BLACK BORDERS
- TEXT CUT OFF AT TOP, BOTTOM OR SIDES
- FADED TEXT
- ILLEGIBLE TEXT
- SKEWED/SLANTED IMAGES
- COLORED PHOTOS
- BLACK OR VERY BLACK AND WHITE DARK PHOTOS
- GRAY SCALE DOCUMENTS

IMAGES ARE BEST AVAILABLE COPY.

**As rescanning documents *will not* correct images,
please do not report the images to the
Image Problem Mailbox.**

PATENT COOPERATION TREATY

PCT

NOTIFICATION OF THE RECORDING
OF A CHANGE(PCT Rule 92bis.1 and
Administrative Instructions, Section 422)

From the INTERNATIONAL BUREAU

To:

BECKER, Konrad
Novartis AG
Corporate Intellectual Property
Patent & Trademark Dept.
CH-4002 Basel
SUISSE

Date of mailing (day/month/year) 08 October 2001 (08.10.01)	IMPORTANT NOTIFICATION
Applicant's or agent's file reference CL/V-31010A/	
International application No. PCT/EP00/05835	International filing date (day/month/year) 23 June 2000 (23.06.00)

1. The following indications appeared on record concerning:

☒ the applicant

 ☐ the inventor

 ☐ the agent

 ☐ the common representative

Name and Address

NOVARTIS AG
Schwarzwaldallee 215
D-4058 Basel
Switzerland

State of Nationality

CH

State of Residence

CH

Telephone No.

Facsimile No.

Teleprinter No.

2. The International Bureau hereby notifies the applicant that the following change has been recorded concerning:

☐ the person

 ☐ the name

 ☒ the address

 ☐ the nationality

 ☐ the residence

Name and Address

NOVARTIS AG
Lichtstrasse 35
D-4056 Basel
Switzerland

State of Nationality

CH

State of Residence

CH

Telephone No.

Facsimile No.

Teleprinter No.

3. Further observations, if necessary:

4. A copy of this notification has been sent to:

<input checked="" type="checkbox"/> the receiving Office	<input type="checkbox"/> the designated Offices concerned
<input type="checkbox"/> the International Searching Authority	<input checked="" type="checkbox"/> the elected Offices concerned
<input checked="" type="checkbox"/> the International Preliminary Examining Authority	<input type="checkbox"/> other:

The International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland

Authorized officer

François BAECHLER

Facsimile No.: (41-22) 740.14.35

Telephone No.: (41-22) 338.83.38

PATENT COOPERATION TREATY

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Commissioner
 US Department of Commerce
 United States Patent and Trademark
 Office, PCT
 2011 South Clark Place Room
 CP2/5C24
 Arlington, VA 22202
 ETATS-UNIS D'AMERIQUE

in its capacity as elected Office

Date of mailing (day/month/year) 07 February 2001 (07.02.01)	
International application No. PCT/EP00/05835	Applicant's or agent's file reference CL/V-31010A/
International filing date (day/month/year) 23 June 2000 (23.06.00)	Priority date (day/month/year) 25 June 1999 (25.06.99)
Applicant HEINRICH, Axel et al	

1. The designated Office is hereby notified of its election made:

☒ in the demand filed with the International Preliminary Examining Authority on:

21 December 2000 (21.12.00)

☐ in a notice effecting later election filed with the International Bureau on:2. The election ☒ was☐ was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Authorized officer R. E. Stoffel
Facsimile No.: (41-22) 740.14.35	Telephone No.: (41-22) 338.83.38

PATENT COOPERATION TREATY

PCT

NOTIFICATION OF THE RECORDING
OF A CHANGE(PCT Rule 92bis.1 and
Administrative Instructions, Section 422)

From the INTERNATIONAL BUREAU

To:

BECKER, Konrad
Novartis AG
Corporate Intellectual Property
Patent & Trademark Dept.
CH-4002 Basel
SUISSE

Date of mailing (day/month/year) 18 December 2001 (18.12.01)	IMPORTANT NOTIFICATION
Applicant's or agent's file reference CL/V-31010A/	
International application No. PCT/EP00/05835	International filing date (day/month/year) 23 June 2000 (23.06.00)

1. The following indications appeared on record concerning:

☒ the applicant ☒ the inventor ☐ the agent ☐ the common representative

Name and Address

MÜLLER, Achim
Kolpingstrasse 44A
D-63762 Grossostheim
Germany

State of Nationality

DE

State of Residence

DE

Telephone No.

Facsimile No.

Teleprinter No.

2. The International Bureau hereby notifies the applicant that the following change has been recorded concerning:

☐ the person ☐ the name ☒ the address ☐ the nationality ☐ the residence

Name and Address

MÜLLER, Achim
Auf der Stichel 10A
63762 Grossostheim
Germany

State of Nationality

DE

State of Residence

DE

Telephone No.

Facsimile No.

Teleprinter No.

3. Further observations, if necessary:

4. A copy of this notification has been sent to:

<input checked="" type="checkbox"/> the receiving Office	<input type="checkbox"/> the designated Offices concerned
<input checked="" type="checkbox"/> the International Searching Authority	<input checked="" type="checkbox"/> the elected Offices concerned
<input type="checkbox"/> the International Preliminary Examining Authority	<input type="checkbox"/> other:

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No.: (41-22) 740.14.35	Authorized officer Catherine MASSETTI Telephone No.: (41-22) 338.83.38
--	--

PATENT COOPERATION TREATY

PCT

NOTIFICATION OF THE RECORDING
OF A CHANGE(PCT Rule 92bis.1 and
Administrative Instructions, Section 422)

From the INTERNATIONAL BUREAU

To:

BECKER, Konrad
Novartis AG
Corporate Intellectual Property
Patent & Trademark Dept.
CH-4002 Basel
SUISSE

Date of mailing (day/month/year) 18 December 2001 (18.12.01)	IMPORTANT NOTIFICATION
Applicant's or agent's file reference CL/V-31010A/	
International application No. PCT/EP00/05835	International filing date (day/month/year) 23 June 2000 (23.06.00)

1. The following indications appeared on record concerning:		
<input checked="" type="checkbox"/> the applicant	<input checked="" type="checkbox"/> the inventor	<input type="checkbox"/> the agent <input type="checkbox"/> the common representative
Name and Address MÜLLER, Achim Kolpingstrasse 44A D-63762 Grossostheim Germany	State of Nationality DE	State of Residence DE
	Telephone No.	
	Facsimile No.	
	Teleprinter No.	
2. The International Bureau hereby notifies the applicant that the following change has been recorded concerning:		
<input type="checkbox"/> the person	<input type="checkbox"/> the name	<input checked="" type="checkbox"/> the address <input type="checkbox"/> the nationality <input type="checkbox"/> the residence
Name and Address MÜLLER, Achim Auf der Stichel 10A 63762 Grossostheim Germany	State of Nationality DE	State of Residence DE
	Telephone No.	
	Facsimile No.	
	Teleprinter No.	
3. Further observations, if necessary:		
4. A copy of this notification has been sent to:		
<input checked="" type="checkbox"/> the receiving Office	<input type="checkbox"/> the designated Offices concerned	
<input checked="" type="checkbox"/> the International Searching Authority	<input checked="" type="checkbox"/> the elected Offices concerned	
<input type="checkbox"/> the International Preliminary Examining Authority	<input type="checkbox"/> other:	

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Authorized officer Catherine MASSETTI
Facsimile No.: (41-22) 740.14.35	Telephone No.: (41-22) 338.83.38

PATENT COOPERATION TREATY

AH

PCT 1C

✓ J. Dietz
A. Hassenbürger
B. Liphardt
R. Naef
G. von Sprecher

PCT

From the INTERNATIONAL BUREAU

To:

BECKER, Konrad
Novartis AG
Corporate Intellectual Property
Patent & Trademark Dept. TM Dept.
CH-4002 Basel
SUISSE

12 Jan. 2001

APPL M/D F/L PS/TS

Kopien:

NOTICE INFORMING THE APPLICANT OF THE COMMUNICATION OF THE INTERNATIONAL APPLICATION TO THE DESIGNATED OFFICES

(PCT Rule 47.1(c), first sentence)

Date of mailing (day/month/year) 04 January 2001 (04.01.01)		APPL M/D F/L PS/TS	
Applicant's or agent's file reference CLV-31010A/ ✓		IMPORTANT NOTICE	
International application No. PCT/EP00/05835 ✓	International filing date (day/month/year) 23 June 2000 (23.06.00) ✓	Priority date (day/month/year) 25 June 1999 (25.06.99) ✓	
Applicant NOVARTIS AG et al			

1. Notice is hereby given that the International Bureau has communicated, as provided in Article 20, the international application to the following designated Offices on the date indicated above as the date of mailing of this Notice:

AG,AU,BZ,DZ,KP,KR,MZ,US

In accordance with Rule 47.1(c), third sentence, those Offices will accept the present Notice as conclusive evidence that the communication of the international application has duly taken place on the date of mailing indicated above and no copy of the international application is required to be furnished by the applicant to the designated Office(s).

2. The following designated Offices have waived the requirement for such a communication at this time:

AE,AL,AM,AP,AT,AZ,BA,BB,BG,BR,BY,CA,CH,CN,CR,CU,CZ,DE,DK,DM,EA,EE,EP,ES,FI,GB,GD,
GE,GH,GM,HR,HU,ID,IL,IN,IS,JP,KE,KG,KZ,LC,LK,LR,LS,LT,LU,LV,MA,MD,MG,MK,MN,MW,MX,
NO,NZ,OA,PL,PT,RO,RU,SD,SE,SG,SI,SK,SL,TJ,TM,TR,TT,TZ,UA,UG,UZ,VN,YU,ZA,ZW

The communication will be made to those Offices only upon their request. Furthermore, those Offices do not require the applicant to furnish a copy of the international application (Rule 49.1(a-bis)).

3. Enclosed with this Notice is a copy of the international application as published by the International Bureau on 04 January 2001 (04.01.01) under No. WO 01/00393

REMINDER REGARDING CHAPTER II (Article 31(2)(a) and Rule 54.2)

If the applicant wishes to postpone entry into the national phase until 30 months (or later in some Offices) from the priority date, a demand for international preliminary examination must be filed with the competent International Preliminary Examining Authority before the expiration of 19 months from the priority date.

It is the applicant's sole responsibility to monitor the 19-month time limit.

Note that only an applicant who is a national or resident of a PCT Contracting State which is bound by Chapter II has the right to file a demand for international preliminary examination.

REMINDER REGARDING ENTRY INTO THE NATIONAL PHASE (Article 22 or 39(1))

If the applicant wishes to proceed with the international application in the national phase, he must, within 20 months or 30 months, or later in some Offices, perform the acts referred to therein before each designated or elected Office.

For further important information on the time limits and acts to be performed for entering the national phase, see the Annex to Form PCT/IB/301 (Notification of Receipt of Record Copy) and Volume II of the PCT Applicant's Guide.

17 JAN. 2001

STERFASSUNG Visum: J. Zahra

STERFASSUNG Visum: J. Zahra

The International Bureau of WIPO
34, chemin des Capucines
1211 Geneva 20, Switzerland

Authorized officer:

J. Zahra

Facsimile No. (41-22) 740.14.35

Telephone No. (41-22) 338.83.38

03.07.2001

CLV -31010A/CVE 64

Anneliese Hassenb rger

VT

PCT

EP00/05835

TREATY

PCT

AL

From the:
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:

BECKER, Konrad
NOVARTIS AG
Corporate Intellectual Property
Patent & Trademark Department
CH-4002 Basel
SUISSE

PCT

WRITTEN OPINION

(PCT Rule 66)

Date of mailing
(day/month/year)

03.04.2001

Applicant's or agent's file reference

CLV -31010A/CVE 64

REPLY DUE

within 3 month(s)
from the above date of mailing

International application No.

PCT/EP00/05835

International filing date (day/month/year)

23/06/2000

Priority date (day/month/year)

25/06/1999

International Patent Classification (IPC) or both national classification and IPC

B29D11/00

Applicant

NOVARTIS AG et al.

1. This written opinion is the first drawn up by this International Preliminary Examining Authority.

2. This opinion contains indications relating to the following items:

- I ☒ Basis of the opinion
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain document cited
- VII ☒ Certain defects in the international application
- VIII ☒ Certain observations on the international application

3. The applicant is hereby invited to reply to this opinion.

When? See the time limit indicated above. The applicant may, before the expiration of that time limit, request this Authority to grant an extension, see Rule 66.2(d).

How? By submitting a written reply, accompanied, where appropriate, by amendments, according to Rule 66.3. For the form and the language of the amendments, see Rules 66.8 and 66.9.

Also: For an additional opportunity to submit amendments, see Rule 66.4.
For the examiner's obligation to consider amendments and/or arguments, see Rule 66.4 bis.
For an informal communication with the examiner, see Rule 66.6.

If no reply is filed, the international preliminary examination report will be established on the basis of this opinion.

4. The final date by which the international preliminary examination report must be established according to Rule 69.2 is: 25/10/2001.

Name and mailing address of the International
preliminary examining authority:

European Patent Office

D-80298 M nch

Tel: +49 89 2399-0 Fax: +49 89 2399-5000

Authorized officer / Examiner

Voutsadopoulos, K

Formalities officer (incl. extension of time limits)

Di Salvo, F



WRITTEN OPINION

International application No. PCT/EP00/05835

I. Basis of the opinion

1. This opinion has been drawn on the basis of (*substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this opinion as "originally filed".*):

Description, pages:

1-6 as originally filed

Claims, No.:

1-16 as originally filed

Drawings, sheets:

1/3-3/3 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:

☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)

Claims NO: 1

Inventive step (IS)

Claims NO: 2-8, 15, 16

Industrial applicability (IA)

Claims

- 2. Citations and explanations**
see separate sheet

VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:
see separate sheet

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:
see separate sheet

Reference is made to the following document:

D1: PATENT ABSTRACTS OF JAPAN vol. 009, no. 087 (M-372), 17 April 1985 (1985-04-17) & JP 59 215838 A (MITSUBISHI DENKI KK), 5 December 1984 (1984-12-05)

V. Reasoned statement under Rule 66.2(a)(ii).

1. In so far as claim 1 is directed to a UV illumination device as such, i.e. the casting mould, the object to be made and the material to be used do not constitute essential features of the claimed subject-matter, the disclosure of document D1 is detrimental to its novelty (Art. 33(2) PCT).
The device known from D1 is clearly suitable for use with the same type of material, for making the same kind of products and furthermore in connection with casting moulds, all in accordance with the intended purpose of the apparatus of claim 1.
2. The dependent claims 2-8, 15 and 16 define constructional additions or alternatives to the device of claim 1, which come within the scope of the customary practice followed by persons skilled in the art, especially as the advantages thus achieved can readily be foreseen. Consequently, the subject-matter of these claims lacks an inventive step (Art 33(3) PCT).
3. Claim 1 amended to refer to a two-part casting mould for an ophthalmic moulding made from a UV crosslinkable polymerisable material, comprising the UV illuminating device as presently defined, would meet the requirements of Art. 33(2) and 33(3) PCT.

VII. Certain defects in the international application.

1. Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in the document D1 is not mentioned in the description, nor is this document identified therein.
2. The features of the claims are not provided with reference signs placed in

parentheses (Rule 6.2(b) PCT).

VIII. Certain observations on the international application.

1. Claim 11 makes reference to a trade name or designation, which appears moreover not to be precisely identified. Therefore claim 11 does not comply with the requirement of Art. 6 PCT for clarity (see the PCT Preliminary Examination Guidelines III-4.5b).
2. Claim 14 cannot be dependent on any of the claims 8-11 on its own, because the feature of a diaphragm is defined for the first time in claim 12 (Art. 6 PCT)

In the event of amendments and in order to facilitate the examination of the conformity of the amended application with the requirements of Article 34(2)(b) PCT, the applicant is requested to clearly identify the amendments carried out, no matter whether they concern amendments by addition, replacement or deletion, and to indicate the passages of the application as filed on which these amendments are based.

Amendments should be filed by way of replacement pages in the manner stipulated by Rule 66.8(a) PCT. If the applicant regards it as appropriate these indications could be submitted in handwritten form on an extra copy of the relevant parts of the application as filed. However, the formal copies with the amendments should be in typewritten form (Rule 11.14), preferably in triplicate.

Moreover, the applicant's attention is drawn to the fact that, as a consequence of Rule 66.8(a) PCT the examiner is not permitted to carry out any amendments under the PCT procedure, however minor these may be.

10 2000
CLV -31010A/CVE 64
Anneliese Hassenb rger

VT
PCT
EP00/05835

From the INTERNATIONAL SEARCHING AUTHORITY

PCT

To:
NOVARTIS AG
Corporate Intellectual Property
Attn. BECKER, Konrad
Patent & Trademark Department
CH-4002 Basel
SWITZERLAND

P + TM Dept.

1 Oct. 2000

NOTIFICATION OF TRANSMITTAL OF
THE INTERNATIONAL SEARCH REPORT
OR THE DECLARATION

(PCT Rule 44.1)

APPL	M/D	F/L	PS/TS
Koplen:			

Date of mailing
(day/month/year)

12/10/2000

Applicant's or agent's file reference

CL/V -31010A/

FOR FURTHER ACTION

See paragraphs 1 and 4 below

International application No.

PCT/EP 00/ 05835

International filing date
(day/month/year)

23/06/2000

Applicant

NOVARTIS AG

1. ☒ The applicant is hereby notified that the International Search Report has been established and is transmitted herewith.

Filing of amendments and statement under Article 19:

The applicant is entitled, if he so wishes, to amend the claims of the International Application (see Rule 46):

When? The time limit for filing such amendments is normally 2 months from the date of transmittal of the International Search Report; however, for more details, see the notes on the accompanying sheet.

Where? Directly to the International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland
Fascimile No.: (41-22) 740.14.35

For more detailed instructions, see the notes on the accompanying sheet.

2. ☐ The applicant is hereby notified that no International Search Report will be established and that the declaration under Article 17(2)(a) to that effect is transmitted herewith.

3. ☐ With regard to the protest against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:

☐ the protest together with the decision thereon has been transmitted to the International Bureau together with the applicant's request to forward the texts of both the protest and the decision thereon to the designated Offices.

☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. **Further action(s):** The applicant is reminded of the following:

Shortly after 18 months from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau as provided in Rules 90bis.1 and 90bis.3, respectively, before the completion of the technical preparations for international publication.

Within 19 months from the priority date, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase until 30 months from the priority date (in some Offices even later).

Within 20 months from the priority date, the applicant must perform the prescribed acts for entry into the national phase before all designated Offices which have not been elected in the demand or in a later election within 19 months from the priority date or could not be elected because they are not bound by Chapter II.

Name and mailing address of the International Searching Authority



European Patent Office, P.B. 5818 Patentlaan 2
NL-2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx: 31.651 epo nl
Fax: (+31-70) 340-3016

Authorized officer

Renate Jordan

NOTES TO FORM PCT/ISA/220

These Notes are intended to give the basic instructions concerning the filing of amendments under article 19. The Notes are based on the requirements of the Patent Cooperation Treaty, the Regulations and the Administrative Instructions under that Treaty. In case of discrepancy between these Notes and those requirements, the latter are applicable. For more detailed information, see also the PCT Applicant's Guide, a publication of WIPO.

In these Notes, "Article", "Rule", and "Section" refer to the provisions of the PCT, the PCT Regulations and the PCT Administrative Instructions respectively.

INSTRUCTIONS CONCERNING AMENDMENTS UNDER ARTICLE 19

The applicant has, after having received the international search report, one opportunity to amend the claims of the international application. It should however be emphasized that, since all parts of the international application (claims, description and drawings) may be amended during the international preliminary examination procedure, there is usually no need to file amendments of the claims under Article 19 except where, e.g. the applicant wants the latter to be published for the purposes of provisional protection or has another reason for amending the claims before international publication. Furthermore, it should be emphasized that provisional protection is available in some States only.

What parts of the international application may be amended?

Under Article 19, only the claims may be amended.

- During the international phase, the claims may also be amended (or further amended) under Article 34 before the International Preliminary Examining Authority. The description and drawings may only be amended under Article 34 before the International Examining Authority.

Upon entry into the national phase, all parts of the international application may be amended under Article 28 or, where applicable, Article 41.

When?

Within 2 months from the date of transmittal of the international search report or 16 months from the priority date, whichever time limit expires later. It should be noted, however, that the amendments will be considered as having been received on time if they are received by the International Bureau after the expiration of the applicable time limit but before the completion of the technical preparations for international publication (Rule 46.1).

Where not to file the amendments?

The amendments may only be filed with the International Bureau and not with the receiving Office or the International Searching Authority (Rule 46.2).

Where a demand for international preliminary examination has been/is filed, see below.

How?

Either by cancelling one or more entire claims, by adding one or more new claims or by amending the text of one or more of the claims as filed.

A replacement sheet must be submitted for each sheet of the claims which, on account of an amendment or amendments, differs from the sheet originally filed.

All the claims appearing on a replacement sheet must be numbered in Arabic numerals. Where a claim is cancelled, no renumbering of the other claims is required. In all cases where claims are renumbered, they must be renumbered consecutively (Administrative Instructions, Section 205(b)).

The amendments must be made in the language in which the international application is to be published.

What documents must/may accompany the amendments?

Letter (Section 205(b)):

The amendments must be submitted with a letter.

The letter will not be published with the international application and the amended claims. It should not be confused with the "Statement under Article 19(1)" (see below, under "Statement under Article 19(1)").

The letter must be in English or French, at the choice of the applicant. However, if the language of the international application is English, the letter must be in English; if the language of the international application is French, the letter must be in French.

NOTES TO FORM PCT/ISA/220 (continued)

The letter must indicate the differences between the claims as filed and the claims as amended. It must, in particular, indicate, in connection with each claim appearing in the international application (it being understood that identical indications concerning several claims may be grouped), whether

- (i) the claim is unchanged;
- (ii) the claim is cancelled;
- (iii) the claim is new;
- (iv) the claim replaces one or more claims as filed;
- (v) the claim is the result of the division of a claim as filed.

The following examples illustrate the manner in which amendments must be explained in the accompanying letter:

1. [Where originally there were 48 claims and after amendment of some claims there are 51]:
"Claims 1 to 29, 31, 32, 34, 35, 37 to 48 replaced by amended claims bearing the same numbers; claims 30, 33 and 36 unchanged; new claims 49 to 51 added."
2. [Where originally there were 15 claims and after amendment of all claims there are 11]:
"Claims 1 to 15 replaced by amended claims 1 to 11."
3. [Where originally there were 14 claims and the amendments consist in cancelling some claims and in adding new claims]:
"Claims 1 to 6 and 14 unchanged; claims 7 to 13 cancelled; new claims 15, 16 and 17 added." or
"Claims 7 to 13 cancelled; new claims 15, 16 and 17 added; all other claims unchanged."
4. [Where various kinds of amendments are made]:
"Claims 1-10 unchanged; claims 11 to 13, 18 and 19 cancelled; claims 14, 15 and 16 replaced by amended claim 14; claim 17 subdivided into amended claims 15, 16 and 17; new claims 20 and 21 added."

"Statement under article 19(1)" (Rule 46.4)

The amendments may be accompanied by a statement explaining the amendments and indicating any impact that such amendments might have on the description and the drawings (which cannot be amended under Article 19(1)).

The statement will be published with the international application and the amended claims.

It must be in the language in which the international application is to be published.

It must be brief, not exceeding 500 words if in English or if translated into English.

It should not be confused with and does not replace the letter indicating the differences between the claims as filed and as amended. It must be filed on a separate sheet and must be identified as such by a heading, preferably by using the words "Statement under Article 19(1)."

It may not contain any disparaging comments on the international search report or the relevance of citations contained in that report. Reference to citations, relevant to a given claim, contained in the international search report may be made only in connection with an amendment of that claim.

Consequence if a demand for international preliminary examination has already been filed

If, at the time of filing any amendments under Article 19, a demand for international preliminary examination has already been submitted, the applicant must preferably, at the same time of filing the amendments with the International Bureau, also file a copy of such amendments with the International Preliminary Examining Authority (see Rule 62.2(a), first sentence).

Consequence with regard to translation of the international application for entry into the national phase

The applicant's attention is drawn to the fact that, where upon entry into the national phase, a translation of the claims as amended under Article 19 may have to be furnished to the designated/elected Offices, instead of, or in addition to, the translation of the claims as filed.

For further details on the requirements of each designated/elected Office, see Volume II of the PCT Applicant's Guide.

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference CL/V -31010A/	FOR FURTHER ACTION see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. PCT/EP 00/ 05835	International filing date (day/month/year) 23/06/2000	(Earliest) Priority Date (day/month/year) 25/06/1999
Applicant NOVARTIS AG		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 4 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

- a. With regard to the language, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

- b. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international search was carried out on the basis of the sequence listing:

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☐ Certain claims were found unsearchable (See Box I).

3. ☐ Unity of invention is lacking (see Box II).

4. With regard to the title,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the abstract,

☐ the text is approved as submitted by the applicant.

☒ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the drawings to be published with the abstract is Figure No.

☐ as suggested by the applicant.

☒ because the applicant failed to suggest a figure.

☐ because this figure better characterizes the invention.

1
☐ None of the figures.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/EP 00/05835

Box III TEXT OF THE ABSTRACT (Continuation of it in 5 of the first sheet)

Line 7: after "fibres" insert " (3) "

Line 8: delete from "fibres" until "can"

Line 8: after "optical" insert "fibres (3), to an ultraviolet lamp (2), an ultraviolet lamp (2) can "

INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP 00/05835

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 B29D11/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 B29D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

PAJ, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 87 04390 A (COOPERVISION OPTICS LIMITED) 30 July 1987 (1987-07-30) cited in the application claim 1	1
A	EP 0 367 513 A (NATIONAL RESEARCH DEVELOPMENT CORPORATION) 9 May 1990 (1990-05-09) cited in the application column 9, line 33 - line 36; claim 1	1
A	US 5 508 317 A (B. MÜLLER) 16 April 1996 (1996-04-16) cited in the application claim 1	1

☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"Z" document member of the same patent family

Date of the actual completion of the international search

6 October 2000

Date of mailing of the international search report

12/10/2000

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx: 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Kesten, W

INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP 00/05835

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 0 637 490 A (CIBA-GEIGY AG) 8 February 1995 (1995-02-08) cited in the application claims 1,3 ---	1
X	PATENT ABSTRACTS OF JAPAN vol. 009, no. 087 (M-372), 17 April 1985 (1985-04-17) & JP 59 215838 A (MITSUBISHI DENKI KK), 5 December 1984 (1984-12-05) abstract ---	1
A	PATENT ABSTRACTS OF JAPAN vol. 011, no. 120 (M-580), 15 April 1987 (1987-04-15) & JP 61 261009 A (KAWASUMI LAB INC), 19 November 1986 (1986-11-19) abstract ---	1
A	PATENT ABSTRACTS OF JAPAN vol. 014, no. 468 (P-1115), 12 October 1990 (1990-10-12) & JP 02 187707 A (SUMITOMO ELECTRIC IND LTD), 23 July 1990 (1990-07-23) abstract ---	1
A	DE 40 14 363 A (GÜNTHER NATH) 7 November 1991 (1991-11-07) column 1 -column 2; claim 1; figure ---	1
A	DE 37 37 605 A (M. F. MUTZHAS) 18 May 1989 (1989-05-18) column 1, line 27 - line 32 ---	1
A	US 4 595 838 A (J. J. KERSCHGENS) 17 June 1986 (1986-06-17) claim 1 ---	1
A	PATENT ABSTRACTS OF JAPAN vol. 1998, no. 04, 31 March 1998 (1998-03-31) & JP 09 326346 A (MATSUSHITA ELECTRON CORP), 16 December 1997 (1997-12-16) abstract -----	1

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/EP 00/05835

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
WO 8704390	A	30-07-1987	AT 54097 T	15-07-1990
			AU 601398 B	13-09-1990
			AU 6892587 A	14-08-1987
			CA 1316649 A	27-04-1993
			CA 1333852 A	10-01-1995
			DE 3763381 D	02-08-1990
			DK 504087 A	25-09-1987
			EP 0255535 A	10-02-1988
			GB 2185933 A,B	05-08-1987
			GB 2219413 A,B	06-12-1989
			JP 7052173 A	28-02-1995
			JP 7071808 B	02-08-1995
			JP 6020761 B	23-03-1994
			JP 1500256 T	02-02-1989
			US 4955580 A	11-09-1990
			US 5036971 A	06-08-1991
EP 367513	A	09-05-1990	AT 124649 T	15-07-1995
			AT 157301 T	15-09-1997
			AT 147323 T	15-01-1997
			AU 632071 B	17-12-1992
			AU 4431489 A	10-05-1990
			CA 2001948 A,C	02-05-1990
			CN 1043463 A,B	04-07-1990
			CN 1065342 A	14-10-1992
			CN 1122277 A,B	15-05-1996
			DE 68923345 D	10-08-1995
			DE 68923345 T	21-12-1995
			DE 68927648 D	20-02-1997
			DE 68927648 T	24-04-1997
			DE 68928283 D	02-10-1997
			DE 68928283 T	02-01-1998
			DK 543789 A	03-05-1990
			EP 0561480 A	22-09-1993
			EP 0561481 A	22-09-1993
			ES 2076216 T	01-11-1995
			ES 2108208 T	16-12-1997
			ES 2096846 T	16-03-1997
			GB 2226272 A,B	27-06-1990
			GB 2237240 A,B	01-05-1991
			GB 2237241 A,B	01-05-1991
			GR 3017372 T	31-12-1995
			GR 3022419 T	30-04-1997
			GR 3025140 T	27-02-1998
			HK 16794 A	11-03-1994
			HK 16994 A	11-03-1994
			HK 74193 A	06-08-1993
			HK 133197 A	24-10-1997
			HK 1001228 A	05-06-1998
			HK 1001251 A	05-06-1998
			JP 1923651 C	25-04-1995
			JP 2172712 A	04-07-1990
			JP 6051305 B	06-07-1994
			SU 1838134 A	30-08-1993
			RU 2044653 C	27-09-1995
			US 5573108 A	12-11-1996
			US 5578332 A	26-11-1996
			US 5143660 A	01-09-1992

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/EP 00/05835

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5508317 A	16-04-1996	AT 178255 T	15-04-1999
		AT 159886 T	15-11-1997
		AT 162814 T	15-02-1998
		AU 705891 B	03-06-1999
		AU 2357997 A	14-08-1997
		AU 682365 B	02-10-1997
		AU 6753894 A	27-01-1995
		AU 682872 B	23-10-1997
		AU 6870194 A	09-02-1995
		AU 680507 B	31-07-1997
		AU 6880294 A	16-02-1995
		BR 9403174 A	11-04-1995
		CA 2128158 A,C	20-01-1995
		CA 2128915 A	30-01-1995
		CA 2129461 A	07-02-1995
		CA 2221162 A	07-02-1995
		CN 1108999 A	27-09-1995
		CN 1107411 A	30-08-1995
		CN 1108175 A	13-09-1995
		CZ 9401726 A	15-11-1995
		CZ 9401807 A	17-01-1996
		CZ 9401869 A	15-02-1995
		DE 59404515 D	11-12-1997
		DE 59405162 D	05-03-1998
		DE 59408026 D	06-05-1999
		DK 637491 T	27-07-1998
		DK 641806 T	21-09-1998
		EP 0637490 A	08-02-1995
		EP 0637491 A	08-02-1995
		EP 0641806 A	08-03-1995
		EP 0790258 A	20-08-1997
		ES 2130384 T	01-07-1999
		ES 2108407 T	16-12-1997
		ES 2112503 T	01-04-1998
		FI 943375 A	20-01-1995
		FI 943496 A	30-01-1995
		FI 943614 A	07-02-1995
		GR 3026004 T	30-04-1998
		GR 3026098 T	29-05-1998
		GR 3030516 T	29-10-1999
		HK 1003029 A	30-09-1998
		HK 1005338 A	31-12-1998
		HU 69316 A,B	28-09-1995
		HU 69318 A	28-09-1995
		HU 69048 A	28-08-1995
		IL 110281 A	30-10-1998
		JP 7068563 A	14-03-1995
EP 637490 A	08-02-1995	GR 3030516 T	29-10-1999
		AT 178255 T	15-04-1999
		AT 159886 T	15-11-1997
		AU 682365 B	02-10-1997
		AU 6753894 A	27-01-1995
		AU 682872 B	23-10-1997
		AU 6870194 A	09-02-1995
		CA 2128158 A,C	20-01-1995
		CA 2128915 A	30-01-1995
		CN 1108999 A	27-09-1995

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/EP 00/05835

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 637490 A		CN 1107411 A	30-08-1995
		CZ 9401726 A	15-11-1995
		CZ 9401807 A	17-01-1996
		DE 59404515 D	11-12-1997
		DE 59408026 D	06-05-1999
		DK 637491 T	27-07-1998
		EP 0637491 A	08-02-1995
		ES 2130384 T	01-07-1999
		ES 2108407 T	16-12-1997
		FI 943375 A	20-01-1995
		FI 943496 A	30-01-1995
		GR 3026004 T	30-04-1998
		HK 1003029 A	30-09-1998
		HU 69316 A, B	28-09-1995
		HU 69318 A	28-09-1995
		IL 110281 A	30-10-1998
		JP 7068563 A	14-03-1995
		JP 7052168 A	28-02-1995
		NO 942691 A	20-01-1995
		NO 942810 A	30-01-1995
		NZ 264031 A	26-03-1996
		NZ 264105 A	26-07-1996
		PL 304314 A	23-01-1995
		PL 304465 A	06-02-1995
		US 5782460 A	21-07-1998
		ZA 9405585 A	01-03-1995
		AT 162814 T	15-02-1998
		AU 705891 B	03-06-1999
		AU 2357997 A	14-08-1997
		AU 680507 B	31-07-1997
		AU 6880294 A	16-02-1995
		BR 9403174 A	11-04-1995
		CA 2129461 A	07-02-1995
		CA 2221162 A	07-02-1995
		CN 1108175 A	13-09-1995
		CZ 9401869 A	15-02-1995
		DE 59405162 D	05-03-1998
		DK 641806 T	21-09-1998
JP 59215838 A	05-12-1984	NONE	
JP 61261009 A	19-11-1986	JP 1851747 C	21-06-1994
		JP 5055285 B	16-08-1993
JP 02187707 A	23-07-1990	NONE	
DE 4014363 A	07-11-1991	NONE	
DE 3737605 A	18-05-1989	NONE	
US 4595838 A	17-06-1986	DE 3232537 A	01-03-1984
		DE 3245655 A	14-06-1984
		DE 8317832 U	15-05-1985
		AU 1943783 A	29-03-1984
		DK 177384 A	03-04-1984
		WO 8400897 A	15-03-1984
		EP 0104466 A	04-04-1984
		JP 59501448 T	16-08-1984

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/EP 00/05835

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 4595838 A		US 4560883 A	24-12-1985
		DD 224495 A	10-07-1985
		DD 231735 A	08-01-1986
		DD 231989 A	15-01-1986
		DE 3322071 A	14-06-1984
		DD 231990 A	15-01-1986
JP 09326346 A	16-12-1997	NONE	

PATENT COOPERATION TREATY

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

P + TM Dept.			
- 8. Aug. 2001			
APPL	M/D	F/L	PS/TS
Kopien:			

PCT

To:

BECKER, Konrad
NOVARTIS AG
Corporate Intellectual Property
Patent & Trademark Department
CH-4002 Basel
SUISSE

NOTIFICATION OF TRANSMITTAL OF
THE INTERNATIONAL PRELIMINARY
EXAMINATION REPORT
(PCT Rule 71.1)

Date of mailing
(day/month/year) 06.08.2001

Applicant's or agent's file reference
CL/V -31010A/CVE 64

IMPORTANT NOTIFICATION

International application No.
PCT/EP00/05835

International filing date (day/month/year)
23/06/2000

Priority date (day/month/year)
25/06/1999

Applicant
NOVARTIS AG et al.

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.
2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.
3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

4. REMINDER

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

Name and mailing address of the IPEA/



European Patent Office
D-80298 Munich
Tel. +49-89 2399-0 Fax: 523656 epmu d

Authorized officer

Langhoff, M.



PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference CLV -31010A/CVE 64	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/EP00/05835	International filing date (day/month/year) 23/06/2000	Priority date (day/month/year) 25/06/1999
International Patent Classification (IPC) or national classification and IPC B29D11/00		
Applicant NOVARTIS AG et al.		



1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 5 sheets, including this cover sheet.

☐ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☒ Certain defects in the international application
- VIII ☒ Certain observations on the international application

Date of submission of the demand 21/12/2000	Date of completion of this report 06.08.2001
Name and mailing address of the International preliminary examining authority:  European Patent Office D-80298 Munich Tel: +49 89 2399-0 Fax: +49 89 2399-4445	Authorized officer Voutsadopoulos, K 

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/EP00/05835

I. Basis of the report

1. With regard to the elements of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, pages:

1-6 as originally filed

Claims, No.:

1-16 as originally filed

Drawings, sheets:

1/3-3/3 as originally filed

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/EP00/05835

☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims 9-11
	No:	Claims 1
Inventive step (IS)	Yes:	Claims 9-11
	No:	Claims 2-8, 12-16
Industrial applicability (IA)	Yes:	Claims 1-16
	No:	Claims

2. Citations and explanations
see separate sheet

VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:
see separate sheet

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:
see separate sheet

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/EP00/05835

Reference is made to the following document:

D1: PATENT ABSTRACTS OF JAPAN vol. 009, no. 087 (M-372), 17 April 1985
(1985-04-17) & JP 59 215838 A (MITSUBISHI DENKI KK), 5 December
1984 (1984-12-05)

V. Reasoned statement under Article 35(2).

1. In so far as claim 1 is directed to a UV illumination device as such, i.e. the casting mould, the object to be made and the material to be used do not constitute essential features of the claimed subject-matter, the disclosure of document D1 is detrimental to its novelty (Art. 33(2) PCT).
The device known from D1 is clearly suitable for use with the same type of material, for making the same kind of products and furthermore in connection with casting moulds, all in accordance with the intended purpose of the apparatus of claim 1.
2. The dependent claims 2-8, 12-15 and 16 define constructional additions or alternatives to the device of claim 1, which come within the scope of the customary practice followed by persons skilled in the art, especially as the advantages thus achieved can readily be foreseen. Consequently, the subject-matter of these claims lacks an inventive step (Art 33(3) PCT).
3. The use of a quartz rod for optical coupling of the UV lamp with the optical fibre, according to claim 9, serves the purpose of allowing high intensity radiation to be transmitted without risk of damaging the optical fibre.
This solution to the problem of increasing the efficiency of the device is not known or made obvious by the available prior art.
Thus, claim 9 meets the requirements of Art. 33(2) and 33(3) PCT.
4. Claims 10 and 11 are dependent on claim 9 and as such also meet the requirements of the PCT with respect to novelty and inventive step.

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/EP00/05835

VII. Certain defects in the international application.

1. Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in the document D1 is not mentioned in the description, nor is this document identified therein.
2. The features of the claims are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).

VIII. Certain observations on the international application.

1. Claim 11 makes reference to a trade name or designation, which appears moreover not to be precisely identified. Therefore claim 11 does not comply with the requirement of Art. 6 PCT for clarity (see the PCT Preliminary Examination Guidelines III-4.5b).
2. Claim 14 cannot be dependent on any of the claims 8-11 on its own, because the feature of a diaphragm is defined for the first time in claim 12 (Art. 6 PCT)

PATENT COOPERATION TREATY

PCT

NOTIFICATION CONCERNING
SUBMISSION OR TRANSMITTAL
OF PRIORITY DOCUMENT

(PCT Administrative Instructions, Section 411)

From the INTERNATIONAL BUREAU

To:

BECKER, Konrad
Novartis AG
Corporate Intellectual Property
Patent & Trademark Dept.
CH-4002 Basel
SUISSE

Date of mailing (day/month/year) 16 August 2000 (16.08.00)	
Applicant's or agent's file reference CLV-31010A/	IMPORTANT NOTIFICATION
International application No. PCT/EP00/05835	International filing date (day/month/year) 23 June 2000 (23.06.00) ✓
International publication date (day/month/year) Not yet published	Priority date (day/month/year) 25 June 1999 (25.06.99) ✓
Applicant NOVARTIS AG et al	

1. The applicant is hereby notified of the date of receipt (except where the letters "NR" appear in the right-hand column) by the International Bureau of the priority document(s) relating to the earlier application(s) indicated below. Unless otherwise indicated by an asterisk appearing next to a date of receipt, or by the letters "NR" in the right-hand column, the priority document concerned was submitted or transmitted to the International Bureau in compliance with Rule 17.1(a) or (b).
2. This updates and replaces any previously issued notification concerning submission or transmittal of priority documents.
3. An asterisk(*) appearing next to a date of receipt, in the right-hand column, denotes a priority document submitted or transmitted to the International Bureau but not in compliance with Rule 17.1(a) or (b). In such a case, the attention of the applicant is directed to Rule 17.1(c) which provides that no designated Office may disregard the priority claim concerned before giving the applicant an opportunity, upon entry into the national phase, to furnish the priority document within a time limit which is reasonable under the circumstances.
4. The letters "NR" appearing in the right-hand column denote a priority document which was not received by the International Bureau or which the applicant did not request the receiving Office to prepare and transmit to the International Bureau, as provided by Rule 17.1(a) or (b), respectively. In such a case, the attention of the applicant is directed to Rule 17.1(c) which provides that no designated Office may disregard the priority claim concerned before giving the applicant an opportunity, upon entry into the national phase, to furnish the priority document within a time limit which is reasonable under the circumstances.

<u>Priority date</u>	<u>Priority application No.</u>	<u>Country or regional Office or PCT receiving Office</u>	<u>Date of receipt of priority document</u>
25 June 1999 (25.06.99)	99112256.5	EP	01 Augu 2000 (01.08.00)

The International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland

Facsimile No. (41-22) 740 14 35 39

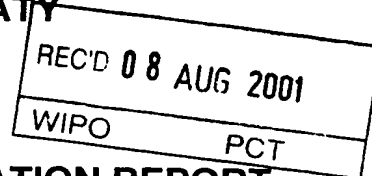
Authorized officer

R. Raissi

Telephone No. (41-22) 338 83 38

PATENT COOPERATION TREATY


PCT



INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

14

Applicant's or agent's file reference CLV -31010A/CVE 64		FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/EP00/05835	International filing date (day/month/year) 23/06/2000	Priority date (day/month/year) 25/06/1999	
International Patent Classification (IPC) or national classification and IPC B29D11/00			
Applicant NOVARTIS AG et al.			
<p>1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 5 sheets, including this cover sheet.</p> <p><input type="checkbox"/> This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).</p> <p>These annexes consist of a total of sheets.</p>			
<p>3. This report contains indications relating to the following items:</p> <ul style="list-style-type: none">I <input checked="" type="checkbox"/> Basis of the reportII <input type="checkbox"/> PriorityIII <input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicabilityIV <input type="checkbox"/> Lack of unity of inventionV <input checked="" type="checkbox"/> Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statementVI <input type="checkbox"/> Certain documents citedVII <input checked="" type="checkbox"/> Certain defects in the international applicationVIII <input checked="" type="checkbox"/> Certain observations on the international application			
Date of submission of the demand 21/12/2000		Date of completion of this report 06.08.2001	
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465		Authorized officer Voutsadopoulos, K Telephone No. +49 89 2399 2922	



INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/EP00/05835

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, pages:

1-6 as originally filed

Claims, No.:

1-16 as originally filed

Drawings, sheets:

1/3-3/3 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/EP00/05835

☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	9-11
	No:	Claims	1
Inventive step (IS)	Yes:	Claims	9-11
	No:	Claims	2-8,12-16
Industrial applicability (IA)	Yes:	Claims	1-16
	No:	Claims	

2. Citations and explanations
see separate sheet

VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:
see separate sheet

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:
see separate sheet

Reference is made to the following document:

D1: PATENT ABSTRACTS OF JAPAN vol. 009, no. 087 (M-372), 17 April 1985 (1985-04-17) & JP 59 215838 A (MITSUBISHI DENKI KK), 5 December 1984 (1984-12-05)

V. Reasoned statement under Article 35(2).

1. In so far as claim 1 is directed to a UV illumination device as such, i.e. the casting mould, the object to be made and the material to be used do not constitute essential features of the claimed subject-matter, the disclosure of document D1 is detrimental to its novelty (Art. 33(2) PCT).
The device known from D1 is clearly suitable for use with the same type of material, for making the same kind of products and furthermore in connection with casting moulds, all in accordance with the intended purpose of the apparatus of claim 1.
2. The dependent claims 2-8, 12-15 and 16 define constructional additions or alternatives to the device of claim 1, which come within the scope of the customary practice followed by persons skilled in the art, especially as the advantages thus achieved can readily be foreseen. Consequently, the subject-matter of these claims lacks an inventive step (Art 33(3) PCT).
3. The use of a quartz rod for optical coupling of the UV lamp with the optical fibre, according to claim 9, serves the purpose of allowing high intensity radiation to be transmitted without risk of damaging the optical fibre. This solution to the problem of increasing the efficiency of the device is not known or made obvious by the available prior art.
Thus, claim 9 meets the requirements of Art. 33(2) and 33(3) PCT.
4. Claims 10 and 11 are dependent on claim 9 and as such also meet the requirements of the PCT with respect to novelty and inventive step.

VII. Certain defects in the international application.

1. Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in the document D1 is not mentioned in the description, nor is this document identified therein.
2. The features of the claims are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).

VIII. Certain observations on the international application.

1. Claim 11 makes reference to a trade name or designation, which appears moreover not to be precisely identified. Therefore claim 11 does not comply with the requirement of Art. 6 PCT for clarity (see the PCT Preliminary Examination Guidelines III-4.5b).
2. Claim 14 cannot be dependent on any of the claims 8-11 on its own, because the feature of a diaphragm is defined for the first time in claim 12 (Art. 6 PCT)

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference CL/V -31010A/	FOR FURTHER ACTION see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. PCT/EP 00/ 05835	International filing date (day/month/year) 23/06/2000	(Earliest) Priority Date (day/month/year) 25/06/1999
Applicant NOVARTIS AG		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 4 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

- a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

- b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing:

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

2. ☐ **Certain claims were found unsearchable** (See Box I).

3. ☐ **Unity of Invention is lacking** (see Box II).

4. With regard to the **title**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

☐ the text is approved as submitted by the applicant.

☒ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No.

☐ as suggested by the applicant.

☒ because the applicant failed to suggest a figure.

☐ because this figure better characterizes the invention.

1

☐ None of the figures.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/EP 00/ 05835

Box III TEXT OF THE ABSTRACT (Continuation of item 5 of the first sheet)

Line 7: after "fibres" insert " (3) "

Line 8: delete from "fibres" until "can"

Line 8: after "optical" insert "fibres (3), to an ultraviolet lamp (2), an ultraviolet lamp (2) can "

INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP 00/05835

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 B29D11/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 B29D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

PAJ, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 87 04390 A (COOPERVISION OPTICS LIMITED) 30 July 1987 (1987-07-30) cited in the application claim 1 ---	1
A	EP 0 367 513 A (NATIONAL RESEARCH DEVELOPMENT CORPORATION) 9 May 1990 (1990-05-09) cited in the application column 9, line 33 - line 36; claim 1 ---	1
A	US 5 508 317 A (B. MÜLLER) 16 April 1996 (1996-04-16) cited in the application claim 1 ---	1
	--- -/--	



Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

* Special categories of cited documents:

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

- "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- "&" document member of the same patent family

Date of the actual completion of the international search

6 October 2000

Date of mailing of the international search report

12/10/2000

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Kesten, W

INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP 00/05835

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 0 637 490 A (CIBA-GEIGY AG) 8 February 1995 (1995-02-08) cited in the application claims 1,3 ---	1
X	PATENT ABSTRACTS OF JAPAN vol. 009, no. 087 (M-372), 17 April 1985 (1985-04-17) & JP 59 215838 A (MITSUBISHI DENKI KK), 5 December 1984 (1984-12-05) abstract ---	1
A	PATENT ABSTRACTS OF JAPAN vol. 011, no. 120 (M-580), 15 April 1987 (1987-04-15) & JP 61 261009 A (KAWASUMI LAB INC), 19 November 1986 (1986-11-19) abstract ---	1
A	PATENT ABSTRACTS OF JAPAN vol. 014, no. 468 (P-1115), 12 October 1990 (1990-10-12) & JP 02 187707 A (SUMITOMO ELECTRIC IND LTD), 23 July 1990 (1990-07-23) abstract ---	1
A	DE 40 14 363 A (GÜNTHER NATH) 7 November 1991 (1991-11-07) column 1 -column 2; claim 1; figure ---	1
A	DE 37 37 605 A (M. F. MUTZHAS) 18 May 1989 (1989-05-18) column 1, line 27 - line 32 ---	1
A	US 4 595 838 A (J. J. KERSCHGENS) 17 June 1986 (1986-06-17) claim 1 ---	1
A	PATENT ABSTRACTS OF JAPAN vol. 1998, no. 04, 31 March 1998 (1998-03-31) & JP 09 326346 A (MATSUSHITA ELECTRON CORP), 16 December 1997 (1997-12-16) abstract -----	1

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/EP 00/05835

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 8704390 A	30-07-1987	AT 54097 T	15-07-1990
		AU 601398 B	13-09-1990
		AU 6892587 A	14-08-1987
		CA 1316649 A	27-04-1993
		CA 1333852 A	10-01-1995
		DE 3763381 D	02-08-1990
		DK 504087 A	25-09-1987
		EP 0255535 A	10-02-1988
		GB 2185933 A,B	05-08-1987
		GB 2219413 A,B	06-12-1989
		JP 7052173 A	28-02-1995
		JP 7071808 B	02-08-1995
		JP 6020761 B	23-03-1994
		JP 1500256 T	02-02-1989
		US 4955580 A	11-09-1990
		US 5036971 A	06-08-1991
EP 367513 A	09-05-1990	AT 124649 T	15-07-1995
		AT 157301 T	15-09-1997
		AT 147323 T	15-01-1997
		AU 632071 B	17-12-1992
		AU 4431489 A	10-05-1990
		CA 2001948 A,C	02-05-1990
		CN 1043463 A,B	04-07-1990
		CN 1065342 A	14-10-1992
		CN 1122277 A,B	15-05-1996
		DE 68923345 D	10-08-1995
		DE 68923345 T	21-12-1995
		DE 68927648 D	20-02-1997
		DE 68927648 T	24-04-1997
		DE 68928283 D	02-10-1997
		DE 68928283 T	02-01-1998
		DK 543789 A	03-05-1990
		EP 0561480 A	22-09-1993
		EP 0561481 A	22-09-1993
		ES 2076216 T	01-11-1995
		ES 2108208 T	16-12-1997
		ES 2096846 T	16-03-1997
		GB 2226272 A,B	27-06-1990
		GB 2237240 A,B	01-05-1991
		GB 2237241 A,B	01-05-1991
		GR 3017372 T	31-12-1995
		GR 3022419 T	30-04-1997
		GR 3025140 T	27-02-1998
		HK 16794 A	11-03-1994
		HK 16994 A	11-03-1994
		HK 74193 A	06-08-1993
		HK 133197 A	24-10-1997
		HK 1001228 A	05-06-1998
		HK 1001251 A	05-06-1998
		JP 1923651 C	25-04-1995
		JP 2172712 A	04-07-1990
		JP 6051305 B	06-07-1994
		SU 1838134 A	30-08-1993
		RU 2044653 C	27-09-1995
		US 5573108 A	12-11-1996
		US 5578332 A	26-11-1996
		US 5143660 A	01-09-1992

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/EP 00/05835

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 5508317	A	16-04-1996	AT 178255 T	15-04-1999
			AT 159886 T	15-11-1997
			AT 162814 T	15-02-1998
			AU 705891 B	03-06-1999
			AU 2357997 A	14-08-1997
			AU 682365 B	02-10-1997
			AU 6753894 A	27-01-1995
			AU 682872 B	23-10-1997
			AU 6870194 A	09-02-1995
			AU 680507 B	31-07-1997
			AU 6880294 A	16-02-1995
			BR 9403174 A	11-04-1995
			CA 2128158 A,C	20-01-1995
			CA 2128915 A	30-01-1995
			CA 2129461 A	07-02-1995
			CA 2221162 A	07-02-1995
			CN 1108999 A	27-09-1995
			CN 1107411 A	30-08-1995
			CN 1108175 A	13-09-1995
			CZ 9401726 A	15-11-1995
			CZ 9401807 A	17-01-1996
			CZ 9401869 A	15-02-1995
			DE 59404515 D	11-12-1997
			DE 59405162 D	05-03-1998
			DE 59408026 D	06-05-1999
			DK 637491 T	27-07-1998
			DK 641806 T	21-09-1998
			EP 0637490 A	08-02-1995
			EP 0637491 A	08-02-1995
			EP 0641806 A	08-03-1995
			EP 0790258 A	20-08-1997
			ES 2130384 T	01-07-1999
			ES 2108407 T	16-12-1997
			ES 2112503 T	01-04-1998
			FI 943375 A	20-01-1995
			FI 943496 A	30-01-1995
			FI 943614 A	07-02-1995
			GR 3026004 T	30-04-1998
			GR 3026098 T	29-05-1998
			GR 3030516 T	29-10-1999
			HK 1003029 A	30-09-1998
			HK 1005338 A	31-12-1998
			HU 69316 A,B	28-09-1995
			HU 69318 A	28-09-1995
			HU 69048 A	28-08-1995
			IL 110281 A	30-10-1998
			JP 7068563 A	14-03-1995
EP 637490	A	08-02-1995	GR 3030516 T	29-10-1999
			AT 178255 T	15-04-1999
			AT 159886 T	15-11-1997
			AU 682365 B	02-10-1997
			AU 6753894 A	27-01-1995
			AU 682872 B	23-10-1997
			AU 6870194 A	09-02-1995
			CA 2128158 A,C	20-01-1995
			CA 2128915 A	30-01-1995
			CN 1108999 A	27-09-1995

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/EP 00/05835

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 637490 A		CN 1107411 A	30-08-1995
		CZ 9401726 A	15-11-1995
		CZ 9401807 A	17-01-1996
		DE 59404515 D	11-12-1997
		DE 59408026 D	06-05-1999
		DK 637491 T	27-07-1998
		EP 0637491 A	08-02-1995
		ES 2130384 T	01-07-1999
		ES 2108407 T	16-12-1997
		FI 943375 A	20-01-1995
		FI 943496 A	30-01-1995
		GR 3026004 T	30-04-1998
		HK 1003029 A	30-09-1998
		HU 69316 A, B	28-09-1995
		HU 69318 A	28-09-1995
		IL 110281 A	30-10-1998
		JP 7068563 A	14-03-1995
		JP 7052168 A	28-02-1995
		NO 942691 A	20-01-1995
		NO 942810 A	30-01-1995
		NZ 264031 A	26-03-1996
		NZ 264105 A	26-07-1996
		PL 304314 A	23-01-1995
		PL 304465 A	06-02-1995
		US 5782460 A	21-07-1998
		ZA 9405585 A	01-03-1995
		AT 162814 T	15-02-1998
		AU 705891 B	03-06-1999
		AU 2357997 A	14-08-1997
		AU 680507 B	31-07-1997
		AU 6880294 A	16-02-1995
		BR 9403174 A	11-04-1995
		CA 2129461 A	07-02-1995
		CA 2221162 A	07-02-1995
		CN 1108175 A	13-09-1995
		CZ 9401869 A	15-02-1995
		DE 59405162 D	05-03-1998
		DK 641806 T	21-09-1998
JP 59215838 A	05-12-1984	NONE	
JP 61261009 A	19-11-1986	JP 1851747 C	21-06-1994
		JP 5055285 B	16-08-1993
JP 02187707 A	23-07-1990	NONE	
DE 4014363 A	07-11-1991	NONE	
DE 3737605 A	18-05-1989	NONE	
US 4595838 A	17-06-1986	DE 3232537 A	01-03-1984
		DE 3245655 A	14-06-1984
		DE 8317832 U	15-05-1985
		AU 1943783 A	29-03-1984
		DK 177384 A	03-04-1984
		WO 8400897 A	15-03-1984
		EP 0104466 A	04-04-1984
		JP 59501448 T	16-08-1984

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/EP 00/05835

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 4595838 A		US 4560883 A	24-12-1985
		DD 224495 A	10-07-1985
		DD 231735 A	08-01-1986
		DD 231989 A	15-01-1986
		DE 3322071 A	14-06-1984
		DD 231990 A	15-01-1986
<hr/>			
JP 09326346 A	16-12-1997	NONE	
<hr/>			

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
4 January 2001 (04.01.2001)

PCT

(10) International Publication Number
WO 01/00393 A2

(51) International Patent Classification⁷: B29D 11/00

(21) International Application Number: PCT/EP00/05835

(22) International Filing Date: 23 June 2000 (23.06.2000)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
99112256.5 25 June 1999 (25.06.1999) EP

(71) Applicant (for all designated States except AT, US): NOVARTIS AG [CH/CH]; Schwarzwaldallee 215, D-4058 Basel (CH).

(71) Applicant (for AT only): NOVARTIS-ERFINDUNGEN VERWALTUNGSGESELLSCHAFT M.B.H. [AT/AT]; Brunner Strasse 59 A-1230 Vienna (AT).

(74) Agent: BECKER, Konrad; Novartis AG, Corporate Intellectual Property, Patent & Trademark Dept., CH-4002 Basel (CH).

(81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.

(84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

(72) Inventors; and

(75) Inventors/Applicants (for US only): HEINRICH, Axel [DE/US]; Aylesbury Farms, 6115 Abbots Bridge Road, Apartment #1409, Duluth, GA 30097 (US). MÜLLER, Achim [DE/DE]; Kolpingstrasse 44A, D-63762 Grossostheim (DE). SEIFERLING, Bernhard [DE/DE]; Dr. Wohlfahrt Strasse 6, D-63773 Goldbach (DE).

Published:

— Without international search report and to be republished upon receipt of that report.

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

WO 01/00393 A2

(54) Title: UV-ILLUMINATION DEVICE

(57) Abstract: The invention relates to a method and device for crosslinking a biocompatible, polymerisable material in order to produce an ophthalmic moulding, especially an ophthalmic lens, particularly a contact lens. The invention is concerned with the problem of further improving the crosslinking process for ophthalmic mouldings consisting of biocompatible polymerisable materials, especially for contact lenses, in order to ensure constant quality of the mouldings. This problem is solved by coupling the UV light into the mould cavity using optical fibres, thereby ensuring homogeneous illumination of the mould cavity. By attaching a number of optical fibres to an ultraviolet lamp, an ultraviolet lamp can be used to crosslink a number of casting moulds, whereupon a very high intensity of illumination can be attained in an efficient manner, enabling rapid polymerisation of the filled moulding material to take place.

UV-illumination device

The invention relates to a method and device for crosslinking a biocompatible, polymerisable material in order to produce an ophthalmic moulding, especially an ophthalmic lens, particularly a contact lens.

Contact lenses, which are to be manufactured economically in large unit numbers, are preferably manufactured by the so-called mould or full-mould process. In these processes, the lenses are manufactured into their final shape between two mould halves, so that there is no need to subsequently finish the surfaces of the lenses, nor to finish the edges. Mould processes are described for example in PCT patent application no. WO/87/04390 or in EP-A 0 367.513.

The contact lenses produced in this manner are moulded parts having little mechanical stability and a water content of more than 60 % by weight. After manufacture, the lens is inspected, then packed and subjected to heat sterilisation at 121°C in an autoclave.

In these known mould processes, the geometry of the contact lenses to be manufactured is defined by the mould cavity. The edge of the contact lens is likewise formed by the mould which normally consists of two mould halves. The geometry of the edge is defined by the contour of the two mould halves in the area in which they make contact.

To manufacture a contact lens, first of all a certain amount of a flowable starting material is placed in the female mould half. Afterwards, the mould is closed by placing the male mould half thereon. Normally, a surplus of starting material is used, so that, when the mould is closed, the excess amount is expelled out into an overflow area adjacent to the mould cavity. The subsequent polymerisation or crosslinking of the starting material takes place by radiation with UV light, or by heat action, or by another non-thermal method.

In US-A-5,508,317, a new contact lens material is described, which represents an important improvement in the chemistry of polymerisable starting materials for the manufacture of contact lenses. The patent discloses a water-soluble composition of a prepolymer, which is filled into the mould cavity and then crosslinked photochemically. Since the prepolymer has

several crosslinkable groups, the crosslinking is of high quality, so that a finished lens of optical quality can be produced within a few seconds, without the necessity for subsequent extraction or finishing steps. Owing to the improved chemistry of the starting material as illustrated in the patent, contact lenses can be produced at considerably lower cost, so that in this way it is possible to produce disposable lenses that are used only once.

EP-A-0 637 490 describes a process by means of which a further improvement may be obtained in the preparation process of contact lenses with the prepolymer described in US-A-5,508,317. Here, the material is filled into a mould comprising two halves, whereby the two mould halves do not touch, but a thin circular gap is located between them. The gap is linked to the mould cavity, so that surplus lens material can flow away into the gap. Instead of the polypropylene moulds that may be used only once, reusable quartz/glass moulds may be used. Because of the water-soluble basic chemistry, after a lens has been produced, the uncrosslinked prepolymer and other residues can be removed from the moulds rapidly and effectively with water, and the moulds dried in the air. In this way, high precision of the lens shaping may also be achieved. Crosslinking of the prepolymer takes place by radiation especially with UV light, whereby radiation is restricted to the mould cavity by a chromium screen. In this way, only the material in the mould cavity is crosslinked, so that there is high reproducibility of the edges of the lens without closing the two polypropylene mould halves. The uncrosslinked shaded-off prepolymer solution can be easily washed away from the shaped, crosslinked lens with water.

However, during radiation with conventional UV lamps, there are frequently problems concerning homogeneity of radiation, especially when using glass casting moulds. Owing to the uneven illumination of the mould cavity, the moulding may have a varying degree of crosslinking, which has a negative effect on the stability of the moulding. The edges in particular are frequently insufficiently polymerised, so that the borders of the moulding are not clearly defined.

The invention is concerned with the problem of further improving the crosslinking process for ophthalmic mouldings consisting of biocompatible polymerisable materials, especially for contact lenses, in order to ensure constant quality of the mouldings.

The invention solves this problem with the features indicated in claim 1. As far as further essential embodiments of the process according to the invention and of the device according to the invention are concerned, reference is made to the dependent claims.

By coupling the UV light into the mould cavity using optical fibres, homogeneous illumination is assured, together with high intensity of radiation of the mould cavity. By attaching a number of optical fibres to an ultraviolet lamp, an ultraviolet lamp can be used to crosslink a number of casting moulds, whereupon a very high intensity of illumination can be attained in an efficient manner, enabling rapid polymerisation of the filled moulding material to take place.

Further details and advantages of the invention may be seen from the description that follows and the drawing. In the drawing,

Fig. 1 shows a schematic illustration of an embodiment of a UV illuminating device according to the invention;

Fig. 2 shows a schematic illustration of a means of coupling the UV light into an optical fibre;

Fig. 3 shows a schematic illustration of the exposure of a casting mould by an optical fibre.

The UV illuminating device 1 illustrated schematically in fig. 1 is preferably mounted in a housing 16 illustrated only schematically here, and consists of a UV lamp 2 and several, advantageously 5 to 50, preferably 10 to 30 optical fibres 3, which surround the UV lamp 2, and are each fixed by a holder 4. The UV lamp 2 in question is suitably a mercury lamp, especially a doped medium pressure mercury lamp, whereby a medium pressure lamp HPA 2020 from Philips or a comparable medium pressure lamp from the company Heraeus can be used for example. The optical fibres 3 conveniently have a length of 0.3 to 2 m and are advantageously formed as liquid optical fibres, since these are particularly well suited to the transmission of UV light. Liquid optical fibres are notable for their high UV transmission, their more homogeneous distribution of intensity of the emerging light rays compared with

quartz fibre bundles, and their higher usable cross-sectional area given the same diameter. The UV lamp 2 can be suitably mounted on a quick-change cradle (not illustrated) to enable the lamp 2 to be exchanged easily. The emission spectrum of the UV lamp 2 advantageously has a high UV intensity in the wavelength range 280 - 360 nm, since in this range various types of photoinitiators that can be used in lens material can be activated, for example Irgacure 2050. Due in particular to the radial arrangement of the optical fibres 3 in relation to the longitudinal axis of the UV lamp 2, a high proportion of the radiation emitting from the UV lamp 2 can be coupled into the optical fibres 3 and thus used for crosslinking. The maximum number of optical fibres that can be used is dependent on the diameter of the UV lamp 2 and the distance to the UV lamp. In addition, there is advantageously a sensor 5, which measures the intensity of UV radiation. It is located near to the UV lamp 2. The measurement is passed on to a regulating unit 6 which compares the measured intensity of radiation with a theoretical value and regulates the current intensity I to keep it constant. In addition, a cool stream of air 7 is provided to cool the UV lamp 2. It is passed from the cold components over the hot components by means of an appropriate construction of the housing 16, or by a ventilator 22, respectively. The air stream is controlled by one or more temperature sensors 8 which measure the temperature inside the housing. The cool air stream ensures that the UV lamp 2 burns at an optimum temperature and that the components in the housing of the lamp do not become overheated. In this way, constant operating conditions are assured, which also prolong the life of the UV lamp 2.

The coupling of UV light into the optical fibres 3 is illustrated in more detail in fig. 2. In order to couple a high intensity of radiation into the optical fibres, a minimum distance to the UV lamp is required, advantageously ca. 1 mm. Since the surface of the UV lamp reaches a temperature or more than 800°C, direct coupling to a liquid optical fibre is impossible owing to its temperature sensitivity. Therefore, the light emitting from the UV lamp is firstly coupled into a quartz rod 9, the diameter of which is co-ordinated with that of the optical fibre 3. The length of the quartz rod 9 depends on the effectiveness of cooling produced by the stream of air. In a first approximation, the length of the quartz rod 9 has no effect on the light intensity that can be coupled into the optical fibres 3. Depending on the design of the lamp, the length of the quartz rod 9 is advantageously between 50 and 120 mm. Between the end of the quartz rod 9 facing away from the UV lamp 2 and the admission area 30 to the optical fibres, there is advantageously a cut-on filter 10 which shades out the short-waved UV radiation < 280 nm, since this causes a more rapid ageing of the optical fibres 3. The cut-on

filter additionally prevents polymer degradation of the lens material. The cut-on filter 10 is suitably a WG 305 or 295 filter from the company Schott. Furthermore, a diaphragm 11 is provided between the cut-on filter 10 and the optical fibre admission area 30. By adjusting the aperture 12 of the diaphragm 11, the intensity of radiation entering the optical fibre 3 can be regulated. To regulate the coupled light intensity, the distance between the optical fibre admission area 30 and the quartz rod 9 can also be modified. If a high UV intensity is desired, the distance should be as short as possible. In particular, there may be provisions for the diaphragm aperture 12 to be controlled via a stepping motor unit 13 which is linked to the diaphragm 11 in particular by a flexible coupling 14, whereby adjustment of the diaphragm aperture 12 can be regulated by the measurement of light intensity using a suitable UV measuring unit 15 at the light exit. There should be provision in particular for the diaphragm 11 of each optical fibre 3 to be adjustable independently. As well as solving this by means of a stepping motor unit, the diaphragms 11 may also be controlled manually if desired. The optical fibres 3 emerge from the housing 16 and are respectively arranged over a casting mould 17.

Fig. 3 depicts the exposure of a casting mould 17 consisting of a lower mould half 18 and an upper mould half 19. Arranged between the end of an optical fibre 3 and the upper mould half 19 is preferably a UV condenser 20, which consists of tempered quartz lenses. The condenser 20 serves to bundle the emitting ray of light. The optics thereof are coordinated with the geometry of the casting mould. In order to produce a contact lens which is polymerised throughout and has good quality of the edges, the distances between the end of the optical fibre 3 and the condenser 20 and between the condenser 20 and the upper mould half 19 are crucial. In addition, for an optimum path of rays, a diaphragm must be provided in the upper mould half 19. If the distance between the condenser 20 and the casting mould 17 is increased, the intensity of radiation is reduced. This leads to slower polymerisation of the lens material. However, if there is constant exposure time and the intensity of radiation is too high, the contact lenses become brittle and the quality of the edges of the contact lenses deteriorates. When selecting the distance between the condenser 20 and the upper mould 19, an optimum setting must be found, which also depends on the geometry of the upper mould half. This distance is suitably between 30 and 5 mm.

In this way, by coupling the UV light into the mould cavity using optical fibres, the invention enables the mould cavity to be illuminated evenly. By coupling a number of optical fibres to a UV lamp, a very high and even intensity of illumination can be attained in an efficient manner, so that it is possible to polymerise the introduced moulding material very rapidly.

What we claim is

1. UV illuminating device for crosslinking biocompatible, polymerisable material in order to produce an ophthalmic moulding, especially an ophthalmic lens, in particular a contact lens, which is produced by crosslinking with UV light in a casting mould consisting of two mould halves, characterised by one or more UV lamps which are each surrounded by several optical fibres, whereby the optical fibres transmit the light emitting from the UV lamp to one or more casting moulds.
2. UV illuminating device according to claim 1, whereby an optical fibre is linked to a casting mould.
3. UV illuminating device according to claim 1 or claim 2, whereby the UV lamp in question is a mercury lamp.
4. UV illuminating device according to claim 3, whereby the UV lamp in question is a doped mercury lamp.
5. UV illuminating device according to one or more of claims 1 to 4, whereby the optical fibres in question are liquid optical fibres.
6. UV illuminating device according to one or more of claims 1 to 5, whereby the emission spectrum of the UV lamp has a high UV intensity at 280 - 360 nm.
7. UV illuminating device according to one or more of claims 1 to 6, whereby a sensor measuring the radiation intensity of the UV lamp is provided and connected to a regulating unit to regulate the UV radiation.
8. UV illuminating device according to one or more of claims 1 to 7, whereby a measuring unit is provided to measure the emitting UV radiation intensity.
9. UV illuminating device according to one or more of claims 1 to 8, whereby in order to couple in the UV radiation, a quartz rod is respectively provided between the UV lamp and the light admission area of the optical fibre.

10. UV illuminating device according to claim 9, whereby a cut-on filter is provided between the quartz rod and the optical fibre in order to absorb short-waved UV radiation.
11. UV illuminating device according to claim 10, whereby a WG 305 is provided as the cut-on filter.
12. UV illuminating device according to one or more of claims 1 to 11, whereby a diaphragm is provided between the optical fibre and the UV lamp.
13. UV illuminating device according to claim 12, whereby the aperture of the diaphragm is adjusted by means of a stepping motor unit.
14. UV illumination device according to one or more of claims 8 to 13, whereby the aperture of the diaphragm is controlled in accordance with the measurement of UV radiation intensity being emitted.
15. UV illuminating device according to one or more of claims 1 to 14, whereby a UV condenser is mounted between the optical fibre and the mould half.
16. UV illuminating device according to one or more of claims 1 to 15, whereby the optical fibres are arranged radially around the UV lamp in relation to the longitudinal axis of the UV lamp.

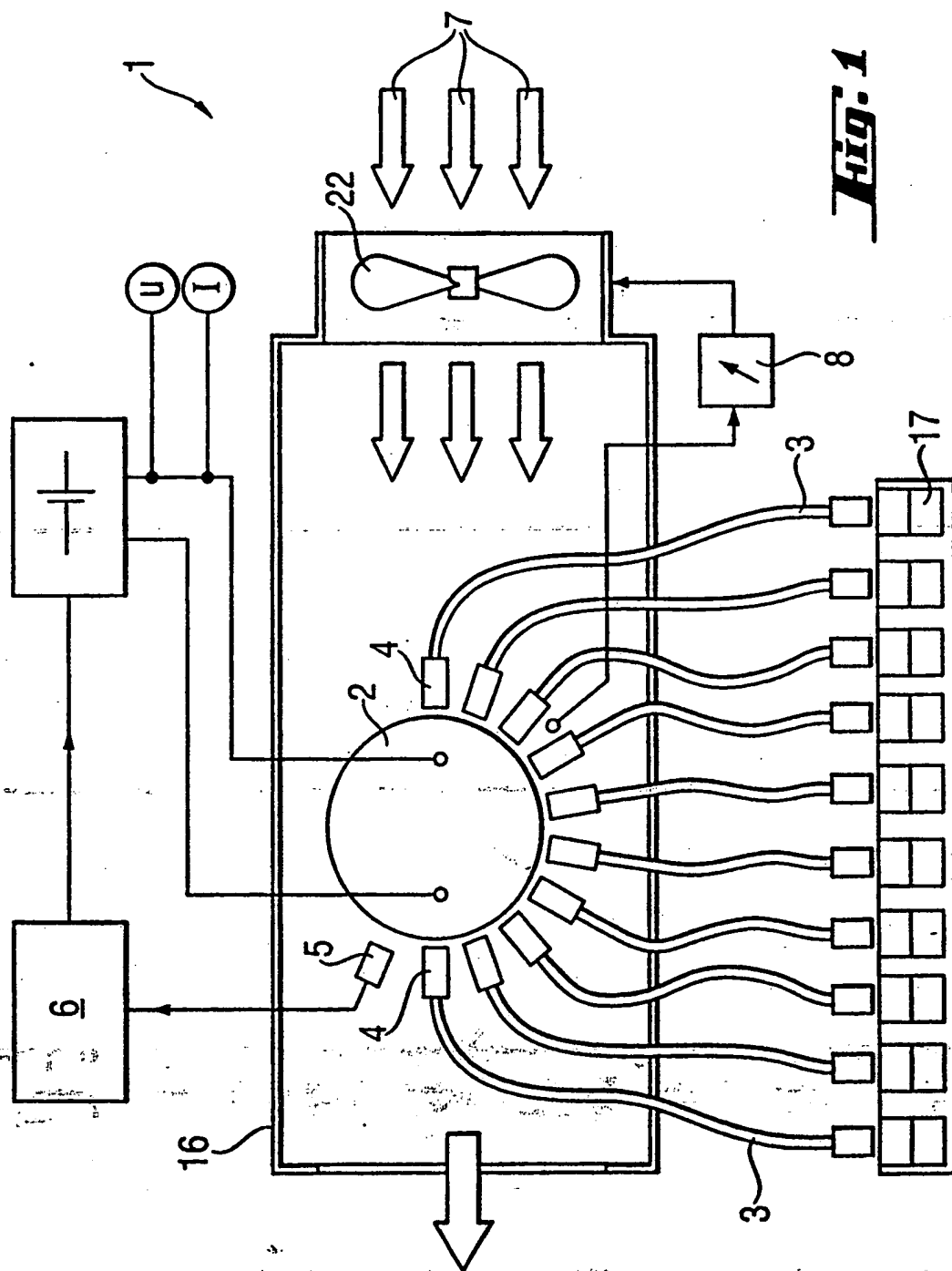
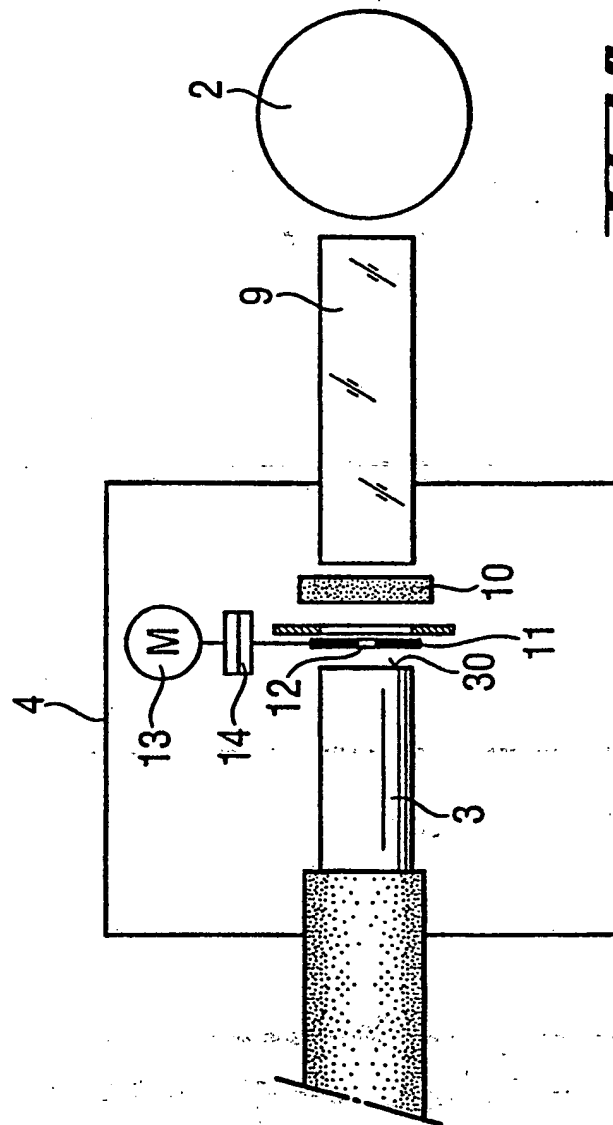


Fig. 1

2/3

**Fig. 2**